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SEQUENCE LISTING

<110> Christeller, John Tane
Sutherland, Paul William
Murray, Colleen
Markwick, Ngaire Patricia
Philip, Bruce Allan
Malone, Louise Anne
Burgess, Elisabeth Phyllis
Phung, Margaret Mary
Phung, Thai Hong
The Horticulture and Food Research Institute of
New Zealand Limited

<120> Chimeric Polypeptides Allowing Expression of
Plant-Noxious Proteins

<130> 020829-000100US

<140> US 09/743,690
<141> 2001-01-12

<150> NZ 331002
<151> 1998-07-15

<150> WO PCT/NZ99/00110
<151> 1999-07-15

<160> 18

<170> PatentIn Ver. 2.1

<210> 1
<211> 324
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:potato
proteinase inhibitor I (PPI-I/pUC19)

<220>
<221> CDS
<222> (1)..(324)
<223> PPI-I/pUC19

<400> 1
atggagtc aa agtttgctca catcattgtt ttctttcttc ttgcaacttc ctggaaact 60
ctcttggcac gaaaagaaag tggatggacca gagatcttag aacttcaaaa ggaattttgaa 120
tgcaatggaa aacaaagggt gccagaactt attgggttac caacaaagct tgctaagggg 180
ataattgaga aggaaaattc actcataact aatgttcaga tactactgaa tggttctcca 240
gtcacaatgg attatcggtt taatcgagtt cgtcttttg ataacatggg ggggtgatgtt 300
gtacaaattc cttaggggtggc tttaa 324

<210> 2
<211> 576
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence:avidin cDNA
      (pGEMav)

<220>
<221> CDS
<222> (44)..(502)
<223> avidin (pGEMav)

<220>
<221> sig_peptide
<222> (44)..(115)
<223> signal sequence

<400> 2
gaattccgca aggagcacac ccggctgtcc acctgctgca gagatggtgc acgcaacctc 60
cccgctgctg ctgctgctgc tgctcagcct ggctctgggt gctcccccggta tccctgccag 120
aaagtgcctcg ctgactggga aatggaccaa cgatctgggc tccaaatcata ccatcggggc 180
tgtgaacagc agaggtgaat tcacaggcac ctacatcaca gccgttaacag ccacatcaaa 240
tgagatcaaa gagtcaccac tgcattggac acaaaacacc atcaacaaga ggacccagcc 300
cacctttggc ttcaccgtca attggaaattt ttcagagtcc accactgtct tcacgggcca 360
gtgcttcata gacaggaatg ggaaggaggt cctgaagacc atgtggctgc tgcggtcaag 420
tggtaatgac attggtgatg actggaaagc taccagggtc ggcataaca tcttcactcg 480
cctgcgcaca cagaaggagt gaggatggcc ccgcaaaagcc agcaacaatg ccggagtgct 540
gacactgctt gtgatattcc tccccataaa agctt 576

<210> 3
<211> 401
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:streptavidin
      cDNA (Streptavidin/pUC19)

<220>
<221> CDS
<222> (11)..(400)
<223> streptavidin (Streptavidin/pUC19)

<400> 3
gaattcgcattt atggctgaag ctggtatcac cggtaacttgg tacaaccagc tggggtctac 60
cttcatcggtt accgctgggt ctgacgggtc actgaccgggt acttacgaaa gcgctgttgg 120
taacgctgaa agccgttatg ttctgaccgg tcgttacgac tctgctccgg ctaccgacgg 180
ttctggtaact gctctgggtt ggaccgttgc ttggaaaaac aactaccgtt acgctcactc 240
tgctaccacc tggctctggcc agtacgttgg tgggtctgaa gctcgtatca acacccagtg 300
gctgctgacc tctggtacca ccgaagctaa cgcttggaaa tctaccctgg ttggtcacga 360
cacgttaccc aaagtttacac cgtctgttc ttctatcttag a 401

<210> 4
<211> 584
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:potato
      proteinase inhibitor II (PPI-II/pUC19)

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<220>
<221> CDS
<222> (1)..(584)
<223> PPI-II/pUC19

<220>
<221> sig_peptide
<222> (1)..(212)
<223> signal sequence

<400> 4
atggatgttc acaaggaagt taatttcgtt gcttacctac taattgttct tggtaagatt 60
ttcccttact cctttgtttt aaaaaataaa aaaacaaaaa aatcttggt ttatacatat 120
atatacacac aagtagtttt attttttcc ttatattat atttgttgc ggaatatttc 180
tacttggtag cgtggggaa catgttgcgc cgaagatctg tactaaagaa tggtaatc 240
ttgggttgg gatatgccc cgttcagaag gaagtccgaa aaatccata tgcataatt 300
gttgctcagg ctataagggt tgtaattatt atagtgttt cgggagattt atttgcgaag 360
gagaatctga cctaaaaaac cccaaagctt gccccctaaa ttgtgatata aatattgcct 420
attcaagatg cccccattca gaaggaaaat cgctaattt tcccacccgaa tgtaccacat 480
gttgcacagg gtacaagggt tgctactatt tggtaaaaaa tggcaagttt gtatgcgaag 540
gagagagtga tgaacccaaag gcaaataatgt accctgcaat gtga 584

<210> 5
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:altered Bam H I
      site

<400> 5
ggagatccaa ccatg 15

<210> 6
<211> 486
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:PPI-I/Avidin
      gene fusion

<220>
<221> CDS
<222> (1)..(486)
<223> PPI-I/Avidin fusion protein

<400> 6
atggagtcaa agtttgctca catcattgtt ttctttcttc ttgcaactcc ctttgaaact 60
ctcttggcac gaaaagaaag tgatggacca gagatccctg ccagaaagtgc ctcgctgact 120
ggaaatgga ccaacgatct gggctccaaat atgaccatcg gggctgtgaa cagcagaggt 180
gaattcacag gcacctacat cacagccgtt acagccacat caaatgagat caaagagtca 240
ccattgcattt ggacacaaaaa caccatcaac aagaggaccc agcccacctt tggcttcacc 300
gtcaattgga agtttcaga gtccaccaact gtcttcacgg gccagtgcattt catagacagg 360
aatggaaagg aggtcctgaa gaccatgtgg ctgctgcgtt caagtgtttaa tgacattgg 420
gtgactgga aagctaccag ggtcggcatc aacatcttca ctcgcctgcg cacacagaag 480
gagtga 486

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<210> 7
 <211> 161
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:PPI-I/Avidin
 fusion protein

<400> 7
 Met Glu Ser Lys Phe Ala His Ile Ile Val Phe Phe Leu Leu Ala Thr
 1 5 10 15
 Pro Phe Glu Thr Leu Leu Ala Arg Lys Glu Ser Asp Gly Pro Glu Ile
 20 25 30
 Pro Ala Arg Lys Cys Ser Leu Thr Gly Lys Trp Thr Asn Asp Leu Gly
 35 40 45
 Ser Asn Met Thr Ile Gly Ala Val Asn Ser Arg Gly Glu Phe Thr Gly
 50 55 60
 Thr Tyr Ile Thr Ala Val Thr Ala Thr Ser Asn Glu Ile Lys Glu Ser
 65 70 75 80
 Pro Leu His Gly Thr Gln Asn Thr Ile Asn Lys Arg Thr Gln Pro Thr
 85 90 95
 Phe Gly Phe Thr Val Asn Trp Lys Phe Ser Glu Ser Thr Thr Val Phe
 100 105 110
 Thr Gly Gln Cys Phe Ile Asp Arg Asn Gly Lys Glu Val Leu Lys Thr
 115 120 125
 Met Trp Leu Leu Arg Ser Ser Val Asn Asp Ile Gly Asp Asp Trp Lys
 130 135 140
 Ala Thr Arg Val Gly Ile Asn Ile Phe Thr Arg Leu Arg Thr Gln Lys
 145 150 155 160
 Glu

<210> 8
 <211> 626
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial
 Sequence:PPI-II/Streptavidin gene fusion

<220>
 <221> CDS
 <222> (1)...(626)
 <223> PPI-II/Streptavidin fusion protein

<220>
 <221> modified_base
 <222> (585)
 <223> n = g, a, c or t

<400> 8
 atggatgttc acaaggaagt taatttcgtt gcttacctac taattgttct tggtaagatt 60
 ttccttact cctttgtttt aaaaaataaa aaaaacaaaaaa aaatcttggt ttatacatat 120
 atatacacac aagtagtttt attttttcc tttatattat atttgttgtt ggaatatttc 180
 tacttggtag cgtgggtggaa catgttgatg cgaagatctg tactaagaat tcgcatatgg 240
 ctgaagctgg tatcaccggt acttggtaca accagctggg gtctaccttc atcgttaccg 300
 ctgggtctga cggtgcaactg accggtaactt acgaaagcgc tggtggtaac gctgaaagcc 360
 gttatgttct gaccggtcgt tacgactctg ctccggctac cgacggttct ggtactgctc 420
 tgggttggac cgttgcttgg aaaaacaact accgtaacgc tcactctgct accacctgt 480

ctggccagta cgttgggtggt gctgaagctc gatatcaacac ccagtggctg ctgacacctg 540
 gtaccaccca agctaaccgtc tggaaatcta ccctgggttgg tcacnacacg ttcacccaaag 600
 ttaaaccgtc tgctgcttct atctag 626

<210> 9
 <211> 168
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial
 Sequence:PPI-II/Streptavidin fusion protein

<400> 9
 Met Asp Val His Lys Glu Val Asn Phe Val Ala Tyr Leu Leu Ile Val
 1 5 10 15
 Leu Gly Ile Phe Leu Leu Val Ser Val Val Glu His Val Asp Ala Lys
 20 25 30
 Ile Cys Thr Lys Asn Ser His Met Ala Glu Ala Gly Ile Thr Gly Thr
 35 40 45
 Trp Tyr Asn Gln Leu Gly Ser Thr Phe Ile Val Thr Ala Gly Ala Asp
 50 55 60
 Gly Ala Leu Thr Gly Thr Tyr Glu Ser Ala Val Gly Asn Ala Glu Ser
 65 70 75 80
 Arg Tyr Val Leu Thr Gly Arg Tyr Asp Ser Ala Pro Ala Thr Asp Gly
 85 90 95
 Ser Gly Thr Ala Leu Gly Trp Thr Val Ala Trp Lys Asn Asn Tyr Arg
 100 105 110
 Asn Ala His Ser Ala Thr Thr Trp Ser Gly Gln Tyr Val Gly Gly Ala
 115 120 125
 Glu Ala Arg Ile Asn Thr Gln Trp Leu Leu Thr Ser Gly Thr Thr Glu
 130 135 140
 Ala Asn Ala Trp Lys Ser Thr Leu Val Gly His Asp Thr Phe Thr Lys
 145 150 155 160
 Val Lys Pro Ser Ala Ala Ser Ile
 165

<210> 10
 <211> 638
 <212> DNA
 <213> Streptomyces avidinii

<220>
 <221> CDS
 <222> (50)..(601)
 <223> streptavidin

<220>
 <221> sig_peptide
 <222> (50)..(121)
 <223> signal sequence

<400> 10
 ccctccgtcc ccgccccggca acaacttaggg agtatttttc gtgtctcac atg cgc aag 58
 Met Arg Lys
 1

atc gtc gtt gca gcc atc gcc gtt tcc ctg acc acg gtc tcg att acg	106
Ile Val Val Ala Ala Ile Ala Val Ser Leu Thr Thr Val Ser Ile Thr	
5 10 15	
gcc agc gct tcg gca gac ccc tcc aag gac tcg aag gcc cag gtc tcg	154
Ala Ser Ala Ser Ala Asp Pro Ser Lys Asp Ser Lys Ala Gln Val Ser	
20 25 30 35	
gcc gcc gag gcc ggc atc acc ggc acc tgg tac aac cag ctc ggc tcg	202
Ala Ala Glu Ala Gly Ile Thr Gly Thr Trp Tyr Asn Gln Leu Gly Ser	
40 45 50	
acc ttc atc gtg acc gcg ggc gcc gac ggc gcc ctg acc gga acc tac	250
Thr Phe Ile Val Thr Ala Gly Ala Asp Gly Ala Leu Thr Gly Thr Tyr	
55 60 65	
gag tcg gcc gtc ggc aac gcc gag agc cgc tac gtc ctg acc ggt cgt	298
Glu Ser Ala Val Gly Asn Ala Glu Ser Arg Tyr Val Leu Thr Gly Arg	
70 75 80	
tac gac agc gcc ccg gcc acc gac ggc agc ggc acc gcc ctc ggt tgg	346
Tyr Asp Ser Ala Pro Ala Thr Asp Gly Ser Gly Thr Ala Leu Gly Trp	
85 90 95	
acg gtg gcc tgg aag aat aac tac cgc aac gcc cac tcc gcg acc acg	394
Thr Val Ala Trp Lys Asn Asn Tyr Arg Asn Ala His Ser Ala Thr Thr	
100 105 110 115	
tgg agc ggc cag tac gtc ggc ggc gag gcg agg atc aac acc cag	442
Trp Ser Gly Gln Tyr Val Gly Gly Ala Glu Ala Arg Ile Asn Thr Gln	
120 125 130	
tgg ctg ctg acc tcc ggc acc acc gag gcc aac gcc tgg aag tcc acg	490
Trp Leu Leu Thr Ser Gly Thr Thr Glu Ala Asn Ala Trp Lys Ser Thr	
135 140 145	
ctg gtc ggc cac gac acc ttc acc aag gtg aag ccg tcc gcc gcc tcc	538
Leu Val Gly His Asp Thr Phe Thr Lys Val Lys Pro Ser Ala Ala Ser	
150 155 160	
atc gac gcg gcg aag aag gcc ggc gtc aac aac ggc aac ccg ctc gac	586
Ile Asp Ala Ala Lys Lys Ala Gly Val Asn Asn Gly Asn Pro Leu Asp	
165 170 175	
gcc gtt cag cag tag tcgcgtccccg gcaccggcggtgtccggac ctcggcc	638
Ala Val Gln Gln	
180	

<210> 11
 <211> 183
 <212> PRT
 <213> *Streptomyces avidinii*

<400> 11
 Met Arg Lys Ile Val Val Ala Ala Ile Ala Val Ser Leu Thr Thr Val
 1 5 10 15
 Ser Ile Thr Ala Ser Ala Ser Ala Asp Pro Ser Lys Asp Ser Lys Ala
 20 25 30
 Gln Val Ser Ala Ala Glu Ala Gly Ile Thr Gly Thr Trp Tyr Asn Gln
 35 40 45

Leu Gly Ser Thr Phe Ile Val Thr Ala Gly Ala Asp Gly Ala Leu Thr
 50 55 60
 Gly Thr Tyr Glu Ser Ala Val Gly Asn Ala Glu Ser Arg Tyr Val Leu
 65 70 75 80
 Thr Gly Arg Tyr Asp Ser Ala Pro Ala Thr Asp Gly Ser Gly Thr Ala
 85 90 95
 Leu Gly Trp Thr Val Ala Trp Lys Asn Asn Tyr Arg Asn Ala His Ser
 100 105 110
 Ala Thr Thr Trp Ser Gly Gln Tyr Val Gly Gly Ala Glu Ala Arg Ile
 115 120 125
 Asn Thr Gln Trp Leu Leu Thr Ser Gly Thr Thr Glu Ala Asn Ala Trp
 130 135 140
 Lys Ser Thr Leu Val Gly His Asp Thr Phe Thr Lys Val Lys Pro Ser
 145 150 155 160
 Ala Ala Ser Ile Asp Ala Ala Lys Lys Ala Gly Val Asn Asn Gly Asn
 165 170 175
 Pro Leu Asp Ala Val Gln Gln
 180

<210> 12
 <211> 22
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:forward M13
 (lacZ) primer [Perkin Elmer]

<400> 12
 gccagggttt tcccaagtac ga

22

<210> 13
 <211> 24
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:reverse M13
 (lacZ) primer [Perkin Elmer]

<400> 13
 gagcggataa caatttcaca cagg

24

<210> 14
 <211> 21
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence:avidin upstream
 primer

 <400> 14
 gcacacccgg ctgtccacct g

21

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<210> 15
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PPI-I
      phosphorylated mutagenic primer

<220>
<221> modified_base
<222> (1)
<223> n = 5' phosphorylated g

<400> 15
natggaccag agatcttaga ac

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22

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<210> 16
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: avidin
      phosphorylated mutagenic primer

<220>
<221> modified_base
<222> (1)
<223> n = 5' phosphorylated g

<400> 16
ngctcccgaa atccctgcca g

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21

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<210> 17
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR sense
      primer

<400> 17
ctgcaggatcg actcttagagg a

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21

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<210> 18
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR antisense
      primer

<400> 18
ggtaattct tagtacagat cttcgca

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27